Castilleja

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To Everything, There is a Phenology

By Lynn Moore

...As the growing season unfolds, think "Phenology!"

Phenology is the study of the timing of recurring biological events. It is not the same thing as seasonality, which refers to abiotic events such as first and last frost or when ice melts on a stream. Observations of phenology have been around a very long time; hunter-gathers and early agricultural societies probably used plants as indicators of seasonal change. Modern phenological observations began as a pastime of country dwellers in 18th century England and eventually developed into a discipline through the organization of the Royal Meteorological Society (Sparks and Carey 1995). The Royal Meteorological Society kept records of phenological observations spanning two centuries and published annual reports between 1875 and 1948. These old reports have helped researchers to identify patterns in phenology and climate.

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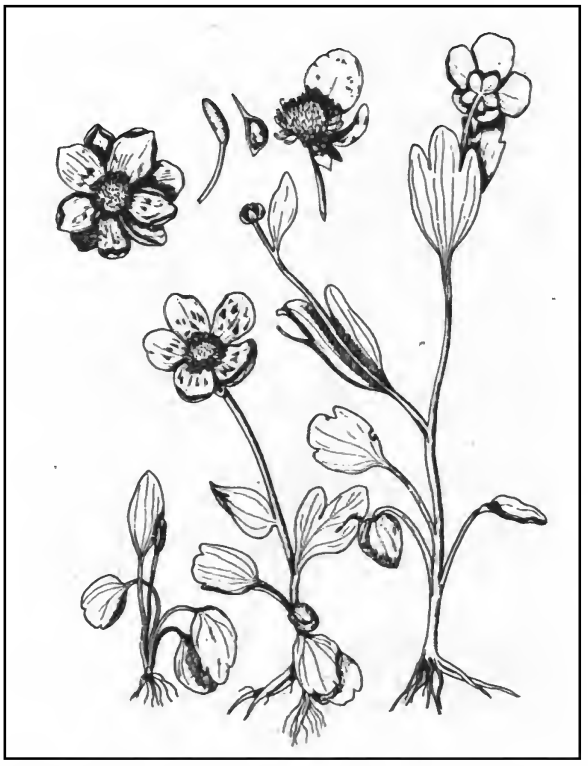

Sagebrush buttercup (*Ranunculus glaberrimus* var. *ellipticus*) is one of our earliest spring flowers. See p. 6 for more information on its phenology. Illustration by Charles Yocum, from: *Rocky Mounain Flora* (Weber 1967).

Today, phenology is important to us for many reasons. Phenology information tells us when to expect the peak wildflower displays. It helps us to predict the onset and intensity of allergens and when to weed and harvest our gardens. Understanding phenology is critical to agriculture for determining when honeybees are needed and in planning harvests. Recreational activities are planned around phenology, for example weekend tours to enjoy fall colors. (Cont. p. 2)

WNPS News

New Members: Please welcome the following new members to WNPS: BKS Environmental, Gillette, Brent Ewers, Laramie; Jill Larson, Spearfish, SD; and Adrienne Pilmanis, Cheyenne.

2009 Scholarship Winner: The 2009 Markow WNPS Scholarship winner is Monia Haselhorst (University of Wyoming), doctoral candidate who is researching hybridization between white spruce (*Picea glauca*) and Engelmann's spruce (*Picea engelmanii*) using the genetics of hybrids as a window into evolution and adaptation. Her work will be conducted in the Big Horn Mountains and Black Hills. The $500 award covers a part of research expenses. Thanks go to everyone who applied AND to all in WNPS who support scholarships.

Treasurer's Report: Balance as of 23 Apr 2009 - General Fund: $1,663.29; Markow Scholarship Fund: $1,016. Total Funds: $2,679.29.

Wyoming Native Plant Society
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Phenology, cont. from p. 1

The U.S. National Phenological Network (US-NPN) took its first steps in the 1950's as a group of observers and volunteers who recorded flowering dates of lilacs. Additional lilac networks grew across the country and scientists saw a need to expand the phenological network to include native species as well as other non-natives. The US-NPN, based at the University of Arizona with co-sponsorship of U.S. Geological Survey and others, was formed in 2005 and 2006 and monitors the influence of climate on the phenology of plants, animals, and landscapes. The network accomplishes this by encouraging people to observe phenological events like leaf out, flowering, migrations, or egg laying, and by providing a place for people to enter, store, and share their observations. Although much of what the US-NPN does is directed toward scientific research, the program is designed to include everyone from children to gardener's to participate in gathering and recording phenological data. Interested parties can sign up on the website to record new phenological observations or submit existing information. Some of the most valuable data comes from long-term family records such as when gardens or crops were planted. Get your kids involved and log onto the US-NPN website (see below for url) and start recording phenological data. It is fun and provides valuable information.

References

Sparks, T. H. and P. D. Carey. 1995. The Responses Of Species To Climate Over 2 Centuries - An Analysis Of The Marsham Phenological Record, 1736-1947. Journal of Ecology 83:321-329.

U.S. National Phenological Network homepage http://www.usanpn.org

2009 WNPS Annual Meeting Announcement

May 30-31, 2009 – the weekend AFTER Memorial Day

The highest concentration of state endemics are found in southwest Wyoming, promising a weekend of adventures! Open to the public!

Castilleja angustifolia var. *dubia*, by Charmaine Delmatier

Schedule of Events

Saturday, May 30

8:00 am, meet at the Green River Recreation Center, 1775 Hitching Post Drive, easiest to access from Upland Way (see map). We will explore:

- Green River greenthread (*Thelesperma caespitosum*), the sentinel of Green River;
-Precocious milkvetch (*Astragalus proimanthus*), near McKinnon;
-Stemless beardtongue (*Penstemon acaulis*), a striking penstemon growing at Flaming Gorge.

Saturday evening informal social:
The Red Canyon Lodge restaurant, located at the Canyon Rim Overlook, is a grand place to close the day at an informal facility with a great menu. Information on it is posted at: www.redcanyonlodge.com., (435) 889-3759. Dinner reservations are not required. . It also has room to picnic, and has log cabins that can be reserved – see lodging options below.

Sunday, May 31

8:30 am, at the Rock Springs BLM parking lot (north end of town on Hwy 191)
Second-day tour-goers can also join at the Red Canyon Overlook on Hwy 28. We will be in hot pursuit of Barneby's clover (*Trifolium barnebyi*) above the Red Canyon Ranch, hear a talk on critical weed control in the area, and look for other endemics (Rocky Mountain twinpod, Beaver Rim phlox, and Fremont bladderpod).

Lodging

The nearest campground to the city of Green River is at Buckboard Crossing south of Green River, about ½ hour south on Hwy 530. It's a bit windy there. For those whose want to reserve a spot ahead of time: 1-800-280-CAMP or www.reserveusa.com. There are other campgrounds around the Gorge (Flaming Gorge, Lucern Valley Marina, Firefighter's Memorial, Greens Lake or Canyon Rim Campground (where we'll be eating dinner at the Red Canyon Lodge) but the drive is about **1 ½** hr from Green River. The motels in Green River are the Hampton Inn & Suites or the Oak Tree Inn, (307) 875-3500. Red Canyon Overlook is about 80 miles north of Rock Springs, and 20 miles south of Lander.

Reminders

Bring snacks, food, and drink both days. Good walking shoes, sunscreen, bug spray, and jackets are a must. We'll be passing by stores but they'll be far and few between. We'll be in the outback of the high cold plateau desert of southwestern Wyoming, but we might luck out and it might be warm. Questions? Contact: Charmaine Delmatier (delmatierc@wyoming.com).

GARDENING AS THOUGH NATURE MATTERED

The following three information resources on gardening with natives are only a click away.

Wildscaping Wyoming

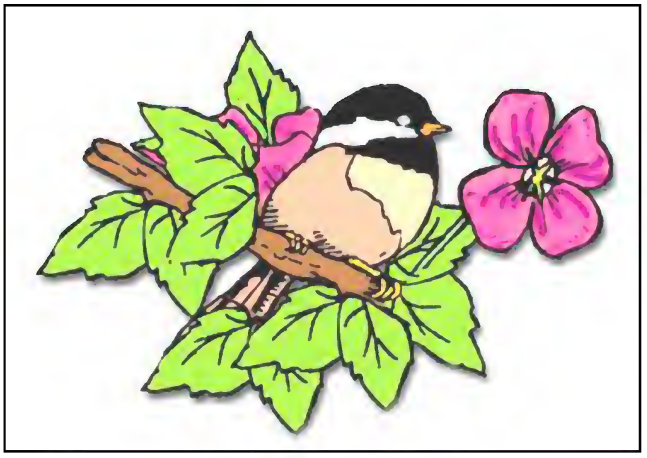
Wyoming Wildscape: How to Design, Plant and Maintain Landscaping to Benefit People and Wildlife. By Andrea Cerovski. 2005. Wyoming Game and Fish Department, Nongame Program, Lander. 64 pp. Available online at: http://gf.state.wy.us/downloads/pdf/WildscapeJune2005.pdf; also available at no cost as a printed booklet from all regional offices of Wyoming Game and Fish Department.

What in the world can a Wyoming wildlife biologist with a backyard do for wildlife? The ensuing frustration and piecemeal answers to that question lead Andrea Cerovski to develop one of the most easily accessible, hands-on guides to planting native plants in Wyoming.

Wyoming is home to 325 species of birds – some are here year-round, while others only spend the summer or winter months in Wyoming, or are found here only during spring and autumn migration. Cerovski proclaims that we can help populations of all native birds by planting native wildscapes – landscaping that benefits both people and wildlife. Wildscaping can be done on virtually any piece of land of any size as long as a wildscaping plan is developed and followed. The guide is a tool to design, plant, and maintain *your* wildscape. The following topics are addressed in the publication:

- Benefits of wildscaping
- Design
- Plant selection
- Guidelines for planting woody plants, wildflowers, and grasses, or to develop watering, terraces, wetlands, composting
- Maintenance
- Do's and Don'ts
- Table of 160+ native plants ideal for wildscaping in Wyoming, comprising over half of the publication, including common name, scientific name, maximum height, growth form, lighting, soil and moisture preferences, wildlife value, stress, noting where the species is native.

In the back of the guide are some additional resources to help you find out more about wildscaping, including the currently available commercial Wyoming sources for native plants, and xeriscaping references.



Native Notions

The University of Wyoming Cooperative Extension Service recently released an April 2009 *Barnyards & Backyards* insert appearing in statewide newspapers, with an article on "Rocky Mountain natives for Wyoming landscapes" by Donna Cuin. If you missed it, there is still a chance to view it at: http://agecon.uwyo.edu/insuringsuccess/BarnyardsAndBackyards/2009BandB/Insert_2009_03.pdf

Cuin introduces the reader to six common plant families, as different as the Aster Family and the Grass Family. Select members are featured in each family. This work draws heavily from the Plant Select® homepage (see the next page), with its own strengths and weaknesses.

We can laud this Cooperative Extension Service initiative, and take heart in the closing words of this article:

"As many of us are trying to develop or rejuvenate gardens more suited to our high plains desert and mountainous Wyoming conditions, considering native plants will become more and more prevalent. As gardeners request these plants, the horticulture trade will become more apt to grow and sell them to meet the needs of their clientele."

This article and more are available through the University of Wyoming Cooperative Extension Service offices or on-line by searching under the headings of "Flowers" and "Plants."

Plant Select

Plant Select® is a cooperative, non-profit program administered by Denver Botanic Gardens and Colorado State University in concert with horticulturists and nurseries throughout the Rocky Mountain region and beyond. The purpose of Plant Select® is to seek out, identify and distribute the very best plants for landscapes and gardens from the intermountain region to the high plains.

Several plants are chosen each year that thrive in the sunny, variable conditions of Rocky Mountain gardens. These can be plants that have grown here for years and have not yet attained the popularity they deserve, known as recommended plants. Introductions represent taxa that are discovered by our cooperators. Superior forms or hybrids carefully tested over time are known as originals. Plant Select® is at the vanguard of a bold, new plant palette that is revolutionizing the way we garden, and helping forge a truly American style of horticulture. They are posted at: http://www.plantselect.org/

The information accompanying striking photos includes height, phenology, lighting and soil conditions, and hardiness. Unfortunately, it does not distinguish between native and non-native species, or the cultivars of native species. It also does not indicate where the species is native, so gardeners might be advised to use this in combination with other resources like *Wyoming Wildscape* (previous page) or like *Growing Native Plants of the Rocky Mountain Area* (Dorn and Dorn 2007; reviewed by W. Fertig in 2007 in *Castilleja* 26(2)), with their more critical information on selecting suitable plants for Wyoming sites and for considering where the species is native. BH

References

Dorn, R.D. and J.L. Dorn. 2007. *Growing Native Plants of the Rocky Mountain* Area. 252 pages. Book version or CD; available at www.lulu.com/content/768231 .

Native Seed Collecting at Vedauwoo, WY: July 30-31, 2009

Vedauwoo is one of the most attractive natural features in southern Wyoming. A rock climbers paradise, this location boasts a tremendous variety of fauna and flora as well. We will camp at Vedauwoo and spend two relaxing days, Thursday & Friday collecting native seeds among the splendor or lush foliage and dramatic sandstone cliffs. Food will be provided.

Many land restoration projects depend on precious hand collected native seed because purchased seeds are unavailable, too expensive or not an acceptable match to the local native species ecotypes. These seeds will be multiplied agriculturally by an inter-government agency partnership. This process increases seeds up to 1000X for revegetation projects on public lands.

To sign up, or for more information, call Wildlands Restoration Volunteers at 303-543-1411, send an e-mail to info@wlrv.org, or sign-up online at www.wlrv.org.

2009 Colorado Native Plant Soc. Meeting September 11-13, 2009

Don't forget to mark the Colorado Native Plant Society 2009 annual meeting on your calendar. It will be held in Windsor, CO, as close to Wyoming as you can get to our state without being in it. This September 11-13 event includes a day of exciting talks and a fieldtrip to Soapstone Ranch, Colorado's largest Colorado butterfly plant population. See the Colorado Native Plant Society homepage for more information: http://www.conps.org/conps.html .

One Bold Buttercup

Sagebrush buttercup (*Ranunculus glaberrimus* var. *ellipticus*) is a bright harbinger of spring across most counties and elevations of Wyoming. For all the furtiveness of spring for gardening, we can indulge in spring for nearly five months of the year if willing to travel and take our cues from sagebrush buttercup.

If you missed the sagebrush buttercup show at 3,850 ft near Hulett this past March, it can still be found flowering in the Laramie Hills in May, in many other mountains in June, and at 11,580 ft in the Beartooth Mountains in July. Specimens at Rocky Mountain Herbarium capture the elevation gradient of its flowering phenology, with peak flowering activity approaching in mid May through mid June at mid-elevations (Figure 1).

The glistening, bright petals of buttercups (*Ranunculus* spp.) attract insects, and are the result of epidermal cells packed with pigment and cells directly below packed with starch. The yellow petals offer a mixed message to the animal kingdom. Petals and the rest of the plant are poisonous, laced with alkaloids.

For all of its striking appearance, sagebrush buttercup is small (5-20 cm) and often overlooked. Imagine my surprise to hear it featured in national news one January day a few years ago, when an intrepid Montana ecologist by the name of James Habeck reported that this harbinger of spring had flowered in Missoula under mild midwinter conditions. It turns out he has kept a chronicle of spring's arrival by its buttercups – basic phenology that made national news. What is to be inferred from one bold buttercup? There were no hard conclusions offered in the news byte, but you might want to keep an eye on those buttercups nearest you (see article on phenology, p. 1). BH

Figure 1. Sagebrush buttercup flowering phenology in Wyoming*[1]

Flowering \ Elev (ft)	March wk 4	April wk 1	April wk 2	April wk 3	April wk 4	May wk 1	May wk 2	May wk 3	May wk 4	June wk 1	June wk 2	June wk 3	June wk 4	July wk 1	July wk 2	July wk 3
3660	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4660	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5000	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5330	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5660	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
6000	1	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0
6330	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6660	0	0	1	0	0	1	0	0	3	1	0	1	0	0	0	0
7000	0	0	0	1	2	0	0	1	5	1	0	0	0	0	0	0
7330	0	0	0	0	0	0	0	4	0	1	1	1	0	0	0	0
7660	0	0	0	0	1	0	0	1	1	0	7	2	0	0	0	0
8000	0	0	0	0	0	1	0	3	3	1	4	3	2	0	1	0
8330	0	0	0	0	0	0	0	1	3	4	3	2	2	0	0	0
8660	0	0	0	1	0	0	0	0	0	3	1	1	2	1	0	0
9000	0	0	0	0	0	0	0	0	0	1	3	2	2	2	0	0
9330	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0
9660	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0
10000	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1
10330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10660	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
11000	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
11330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

[1] *From all *Ranunculus glaberrimus* flowering specimens at RM that also have elevation recorded with precision (+/- 200 ft). Total=114. Cells are highlighted to represent those weekly periods with the highest flowering number of specimens for each elevation interval. This does not take into account differences in latitude , habitat, and year of collection.

Bighorn Native Plant Society Fieldtrips

Amsden Creek elk winter range
May 16, 2009 with Bob Giurgevich. Meet in the K-Mart parking lot in Sheridan, WY at 8:30am or at the Tongue River Bridge in Dayton, WY at 9am. E-mail Jean Daly for more information (djdaly@fiberpipe.net).

Destination TBA
June 28, 2009 - with Dick Birkholz. - E-mail Jean Daly for more information (djdaly@fiberpipe.net).

Bud Love Wilderness Area
July 25, 2009, with Ami Erickson. E-mail Ami Erickson for more information (ami.erickson@gmail.com)

Sheridan College Outreach Classes

Wildflowers of Wyoming courses are now being offered through Sheridan College. These 1 day courses can be taken for 1 credit. For further information, please contact: (ami.erickson@gmail.com) .

***Wildflowers of Wyoming AND Hiking*: Using GPS**, June 24, 2009, with Ami Erickson and Dave Munsick. We'll be heading up Hwy 16 Southwest of Buffalo. We will stop at various locations to identify flowers and learn how to use a GPS system to track and find these flowers in the future. Transportation is provided, but room is limited, so register soon.

***Wildflowers of Wyoming AND Hiking*: Healthy Hiking**, July 18, 2009, with Ami Erickson and Christy Lohof: We'll be heading up Hwy 16 Southwest of Buffalo. We will stop at various locations to identify flowers and do some guided hiking. Transportation is provided, but room is limited, so register soon.

Leaps in Lichenology - the Big Horn Mountains

Clifford Wetmore, the University of Minnesota lichenologist who inventoried Black Hills lichens (Wetmore 1967) and coauthored Yellowstone National Park inventory results (Eversman et al. 2002), recently published the results of lichen collections made over a two-week collecting trip in the Big Horn Mountains (Wetmore 2009). He documented 202 species, a significant contribution to the montane lichen flora of northern Wyoming.

The relatively intact lichen flora of Wyoming and air quality indicator value of lichens provide exciting prospects for exploring these fascinating bastions of symbiosis. Readers are referred to the "classic" *Lichens of North America* (Brodo et al. 2001; reviewed by E. Holt in *Castilleja* 21(1)), the *Macrolichens of the Northern Rocky Mountains* (McCune and Goward 1995), and the recent *Field Guide to Biological Soil Crusts of Western U.S. Drylands* (Rosentretter et al. 2008) if contemplating your own leaps into lichenology. BH

References

Brodo, I.M., S.D. Sharnoff, and S. Sharnoff. 2001. *Lichens of North America*. Yale University Press. New Haven, CT.
Eversman, S., C. Wetmore, K. Glew, and J. Bennett. Patterns of lichen diversity in Yellowstone National Park.
McCune, B. and T. Goward. 1995. *Macrolichens of the Northern Rocky Mountains*. Mad River Press, Inc. Eureka, CA.
Rosentreter, R., M. Bowker and J. Belnap. 2008. *A Field Guide to Biological Soil Crusts of Western U.S. Drylands*. U.S. Government Printing Office, Denver, CO.
Wetmore, C. 1967. Lichens of the Black Hills of South Dakota and Wyoming. Publ. Museum, Michigan State Univ. 3(4).
Wetmore, C. 2009. Lichens collected in the Big Horn Mountains, Wyoming. Evansia 26(1): 10-14.

Announcing:

Yellowstone Institute Field Courses

Four favorite plant courses are offered this year by Yellowstone Institute:

Spring Wildflowers, June 6-7
Jen Whipple, Botanist, Yellowstone National Park

Plants of Yellowstone NP's Indian People
June 16-18, Wayne Phillips, author

The ART of Wildflower Identification
June 26-28, Meredith Campbell, artist

Alpine Wildflowers – Beartooths, July 13-15
John Campbell, Northwestern University

For information on fees, or to register, call Yellowstone Institute, 307-344-2293; or visit the web site at http://yellowstoneassociation.org/ .

Wyoming Native Plant Society
P.O. Box 2500
Laramie, WY 82073

Wyoming Native Plant Society is a non-profit organization established in 1981, dedicated to encouraging the appreciation and conservation of the native flora and plant communities of Wyoming. The Society promotes education and research on native plants of the state through its newsletter, field trips, and annual student scholarship award. Membership is open to individuals, families, or organizations. To join or renew, return this form to:

Wyoming Native Plant Society
P.O. Box 2500, Laramie, WY 82073

Name: _____

Address: _____

_____

Email: _____

___ $7.50 Regular Membership
___ $15.00 Scholarship Supporting Member

($7.50 goes to the Markow Scholarship Fund)

Check one:

_____New member
_____Renewing member

__Renewing members, check here if this is an address change.